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PENSOFT

First record of the Bignose Unicornfish, *Naso vlamingii* (Perciformes, Acanthuridae) from Korea

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Abstract
Naso vlamingii (Valenciennes, 1835) is reported from Korea for the first time and a morphological description is provided. A single specimen of *N. vlamingii* was collected from the southeastern coast of Jeju Island, Korea in September 2017. This species is characterized by the presence of 2 bony plates on the middle of the caudal peduncle, 6 dorsal and 2 anal fin spines, and a rounded, convex, swollen snout. This species is the fifth species of the genus *Naso* Lacepède, 1801 in the Korean fish fauna, and the newly proposed Korean name for the species is "Keun-ko-pyo-mun-jwi-chi".

Key words
First record, *Naso vlamingii*, Acanthuridae, Jeju Island, subtropical fish.

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Introduction

The family Acanthuridae (order Acanthuriformes) is distributed in tropical and subtropical waters (Nelson et al. 2016) and contains 6 genera and 85 species worldwide (Hastings et al. 2014). In Korea, 3 genera and 6 species have been reported to date (Kim et al. 2005, Kim et al. 2007, Kim et al. 2008). Twenty species in the genus *Naso* Lacepède, 1801 have been recognized worldwide, including 4 species in Korea (Nelson et al. 2016, Kim et al. 2005, Kim et al. 2008). The genus is characterized by 2 anal fin spines, 3 pelvic fin soft rays, 1 or 2 bony plates on the caudal peduncle, and 4 branchiostegal rays (Nelson et al. 2016).

In this study, a single specimen of the genus *Naso* was collected from the southeastern coastal waters of Jeju Island. This specimen was identified as *Naso vlamingii* (Valenciennes 1835) on the basis of its morphology, but this species has not previously been recorded from Korea. Therefore, *N. vlamingii* is reported from Korea for the first time and a morphological description is provided.

Methods

A single specimen of *N. vlamingii* was collected from the coastal waters of northwestern Jeju Island (Fig. 1) in September 2017, from which a stuffed specimen was made. All counts and measurements were made according to Hubbs et al. (2004). Measurements were made to the nearest 0.1 mm with a digital Vernier caliper before making the stuffed specimen. The specimen is stored at the Jeju Marine Animal Museum (MAF).

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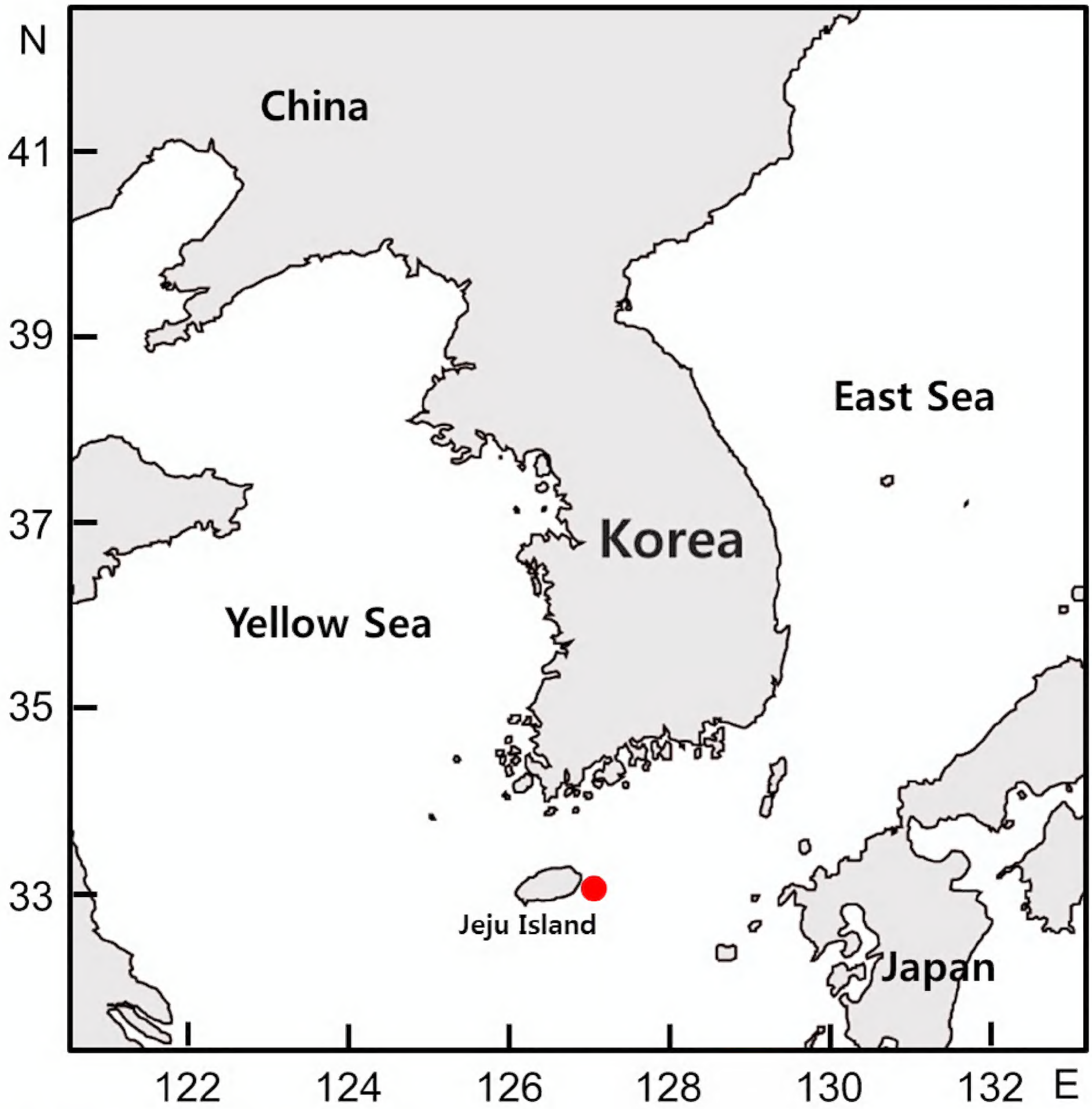

Figure 1. Collecting site (red circle) of *Naso vlamingii*.

Results

New record. Korea: Jeju Island: Seogwipo: Seongsan-eup: Sincheon-ri (33°20′31.43″ N, 126°52′21.77″ E), Heakyoung Jung, 30 September 2017 (1 specimen, standard length 299.9 mm, MAF-1001) (Fig. 2).

Identification. The specimen was assigned to the genus *Naso* based on the following morphological characters: presence of 2 anal spines; 3 pelvic fin soft rays; and fixed bony plates on the caudal peduncle (Nelson et al. 2016). Of the species in this genus, the specimen was identified as *N. vlamingii* on the basis of the presence of 2 bony plates on the caudal peduncle, 6 and 26 dorsal fin spines and soft rays, respectively, 27 anal fin soft rays, non-humped dorsal profile, a swollen snout without a horn (Shimada 2013), caudal fin with a filament, and vertical blue lines with small spots on body side (Randall 2001).

Description. Counts are listed in Table 1. Proportions of fresh specimen (as percentage of SL): head length 23.2; body depth 39.1; caudal peduncle depth 4.7; caudal peduncle length 12.2; predorsal length 20.3; prepectoral length 23.0; prepelvic length 23.6; preanal length 32.5;

Table 1. Comparison of meristic characters of *Naso vlamingii* from different studies.

	Naso vlamingii		
	Present study	**Shimada (2013)**	**Allen and Erdmann (2012)**
Number of specimens	1	—	—
Standard length (mm)	299.9	—	—
Dorsal fin	VI, 26	VI, 26–27	VI, 26–27
Anal fin	II, 27	II, 26–29	II, 27–29
Pectoral fin	16	16–19	17–19
Pelvic fin	I, 3	I, 3	I, 3

Figure 2. *Naso vlamingii*, MAF-1001, 299.9 mm SL. Arrow indicates elongated lobes of caudal fin. Bar indicates 50 mm.

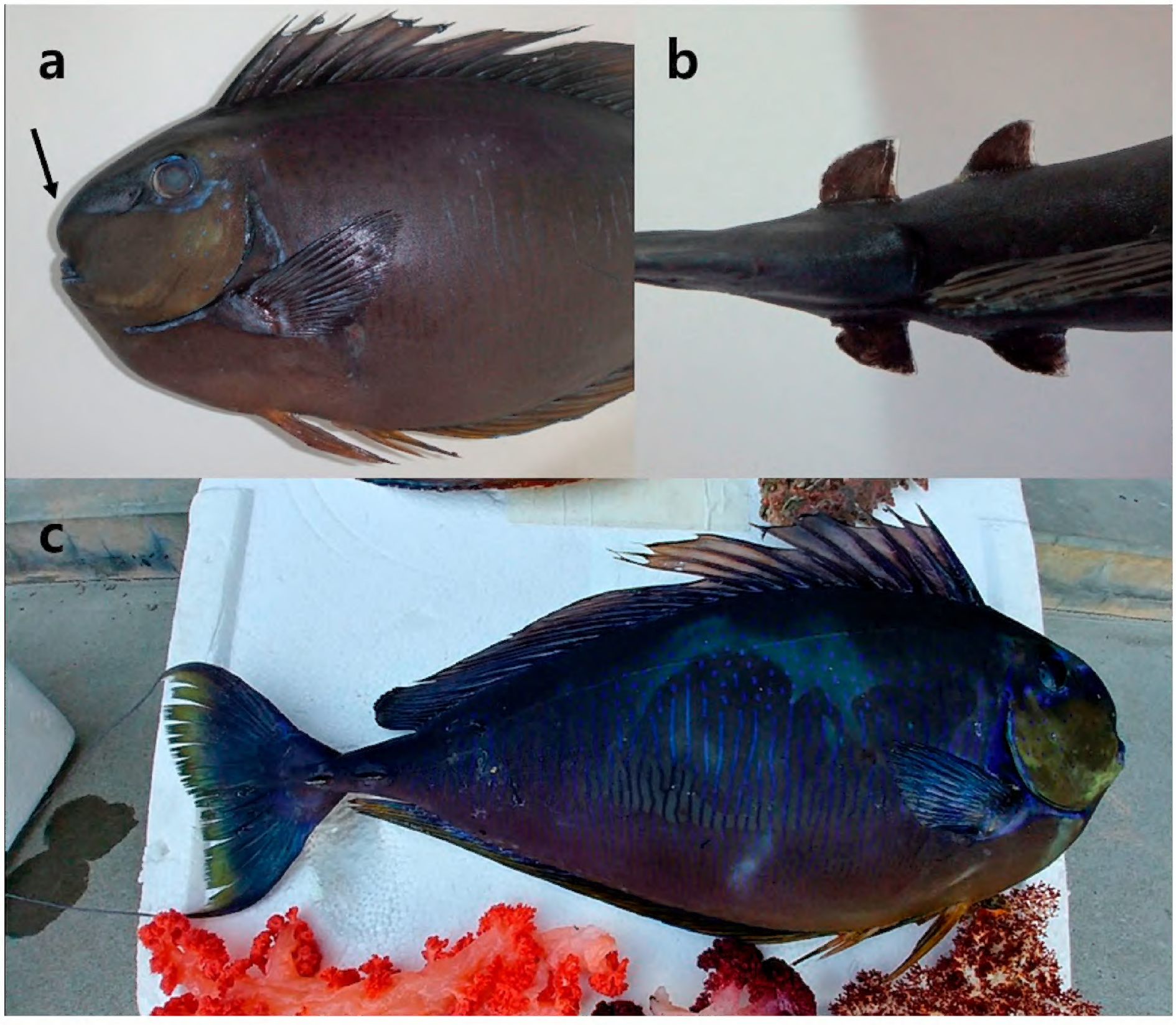

Figure 3. Characteristics of *Naso vlamingii*. **a]** swollen snout (arrow). **b]** bony plates. **c]** fresh coloration.

dorsal fin base length 67.8; anal fin base length 56.1. Proportions as percentage of head length: snout length 55.2; interorbital width 36.3; eye diameter 22.2; postorbital length 25.3; suborbital width 55.7; upper jaw length 16.8; pectoral fin length 70.0; pelvic fin length 63.4.

Body oval, moderately elongate, and compressed. Dorsal edge of snout convex, rounded, swollen, and without a long horn (Fig. 3a). Dorsal profile not humped. Mouth terminal, small, and lips thick. Small conical teeth present. Posterior tip of maxilla not reaching anterior edge of eye. Interorbital region slightly convex. Upper end of gill opening located at about level of lower edge

of eye. Gill membranes attached to isthmus. Origin of dorsal fin located at upper end of gill opening vertically. Caudal peduncle slender, 2 bony plates on each side (Fig. 3b). Base of dorsal and anal fins long. Caudal fin truncate, posterior end of upper and lower lobes elongate (Fig. 2). Lateral line present, but posterior part incomplete. Scales very small, rough, and skin leathery.

Coloration: When alive, head and body darkish yellow. Blue band on face anterior to eye. Blue marks on and around the mouth, pectoral fin base, and gill opening. Body with blue spots dorsally and vertical lines ventrally (Fig. 3c). All fins dark, yellowish blue. Caudal fin darkish blue anteriorly and darkish yellow posteriorly. Elongated caudal fin lobes blue. After death, head and body darkish brown with faint blue spots and vertical lines.

Distribution. *Naso vlamingii* is widely distributed in the Indo-Pacific region, including East Africa to Indonesia, Micronesia, Australia (Allen et al. 2015), Taiwan (Shen and Wu 2011), Japan (Shimada 2013), and French Polynesia (Bacchet et al. 2017). The present specimen from southeastern coast of Jeju Island represents the first record of *N. vlamingii* from Korea (present study, Fig. 1).

Discussion

The specimen corresponds to the original description of *N. vlamingii* (=*Naseus vlamingii*) in the coloration and markings, including the presence of blue spots and vertical lines on body. Comparing *N. vlamingii* with the 6 Acanthurid species reported from Korea, the species differs from *Acanthurus nigricauda* Duncker and Mohr, 1929 by the plate on the caudal peduncle (fixed plate in *N. vlamingii* vs. folding plate in *A. nigricauda*), and from *Prionurus scalprum* Valenciennes, 1835 by the number of dorsal and anal spines (6 and 2 in *N. vlamingii* vs. 9 and 3–4 in *P. scalprum*, respectively) (Shimada 2013). The species is further distinguishable from 4 congeneric species, *Naso brevirostris* (Cuvier, 1829) and *Naso unicornis* (Forsskål, 1775) by the horn on the head (absent in *N. vlamingii* vs. present in *N. brevirostris* and *N. unicornis*), and from *Naso lituratus* (Forster, 1801) and *Naso hexacanthus* (Bleeker, 1855) by the shape of the snout (swollen in *N. vlamingii* vs. not swollen in *N. lituratus* and *N. hexacanthus*) (Shimada 2013).

The new Korean name of "Keun-ko-pyo-mun-jwi-chi" is proposed for *N. vlamingii*.

Acknowledgements

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Author's Contributions

HJK identified the species and wrote the manuscript; HJ collected a specimen; both the authors read and approved the manuscript.

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